MINERνA Operations Report

Fermilab AEM

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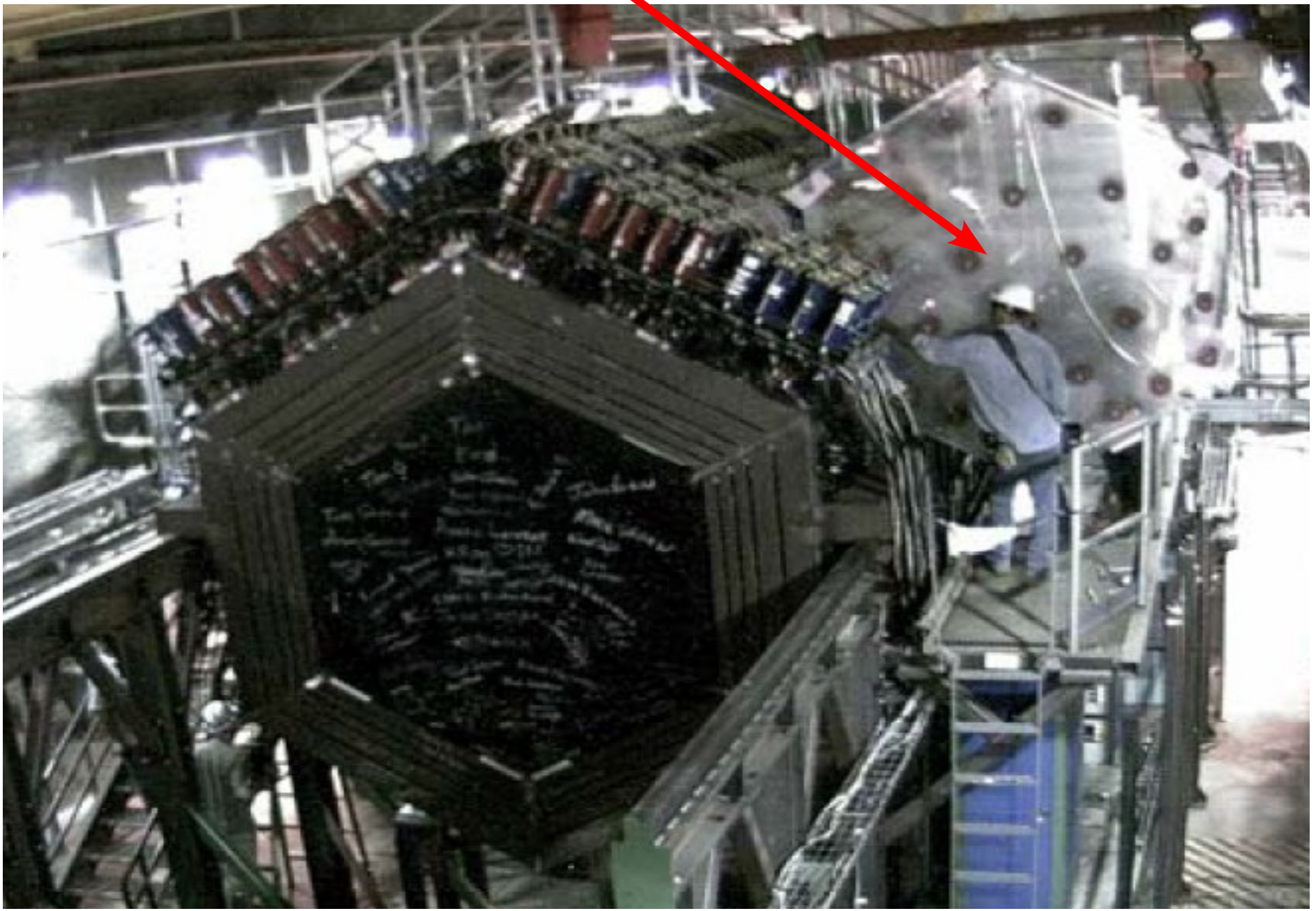
MINERνA detector activities

- **Coming out of the 2010 shutdown :**
  - MINERνA detector is performing well !
  - Operators performed beam scans of the NuMI target yesterday
    - beam intensity has reached ~ 25.0 E12 today
    - MINERνA detector has been taking data successfully the whole time !
    - MINOS Near Detector DAQ and magnet coil problems affect MINERνA too, so we have not started taking physics-quality data

- **Activities between August 16 - 21 :**
  - Water target frame has been installed in the detector
    - MINERνA is evaluating the risks involved with different fill levels of this water target
  - An additional light-injection box (calibration purposes) has been installed, tested and commissioned

Installing the water target frame



Thanks to John Voirin, John Cornele, Jeremy Griffin (mech. techs. of PPD) for yet another job well done !

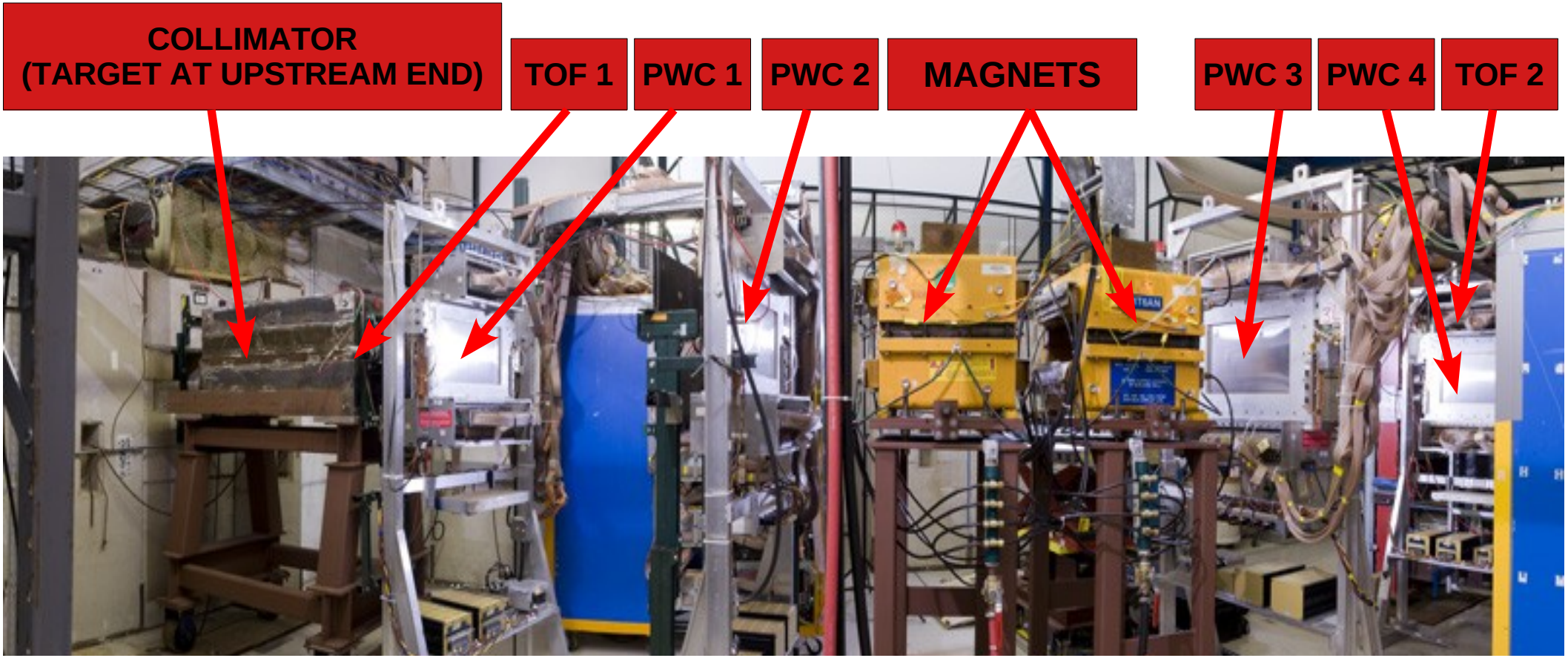
T977 MINERνA Test Beam Experiment

- **Aim :**
  - To provide a low energy calibration of the tracking and calorimetric responses of the MINERνA detector via the TB detector

- **The T977 experiment possesses :**
  - A dedicated, low energy, tertiary beamline of pions (and protons)
  - A reconfigurable, 40-plane, scintillating detector – replica of MINERνA detector

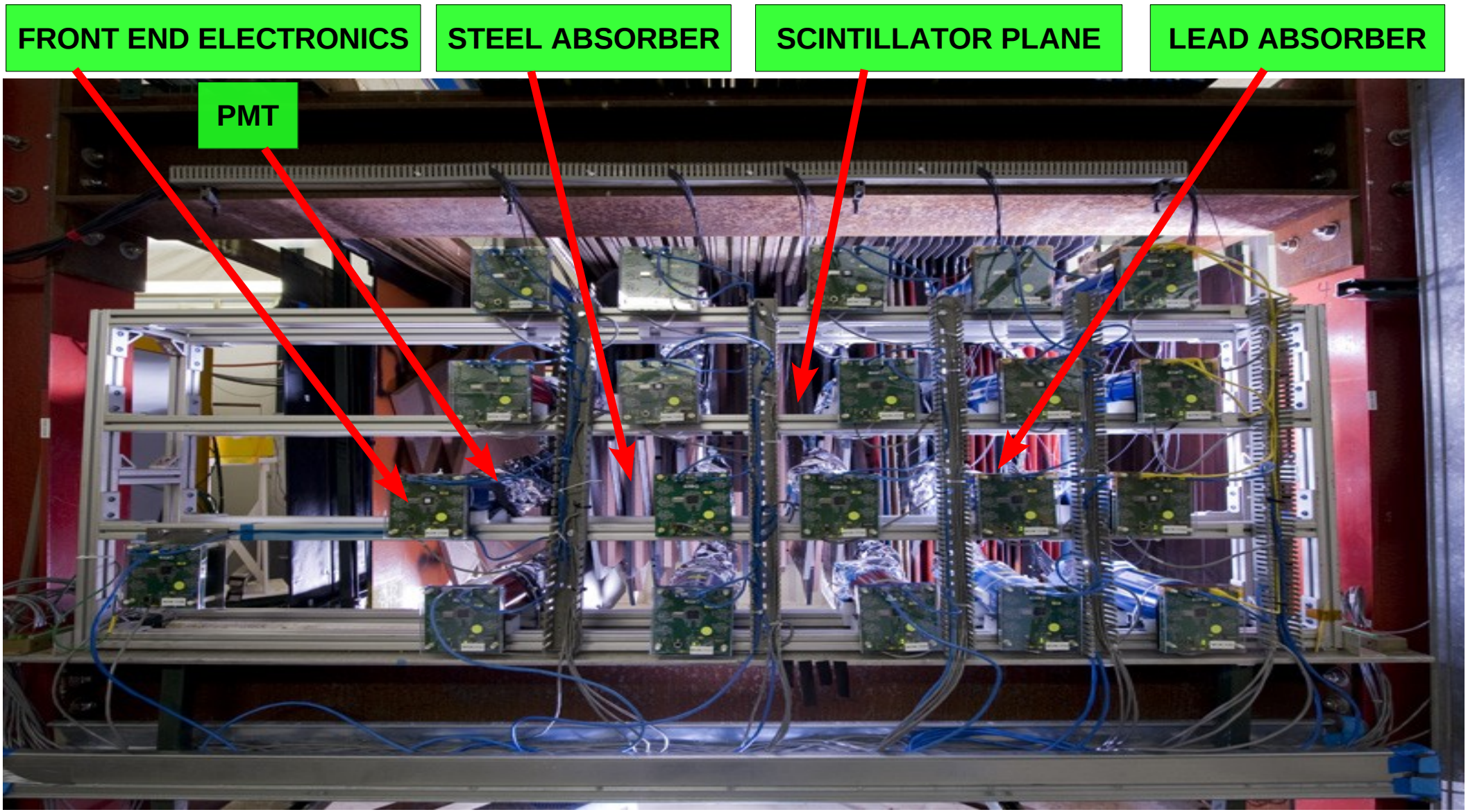
- **Physics data-taking runs :**
  - June 7-27 : 20 ECAL – 20 HCAL detector configuration
  - July 1-16 : 20 Tracker – 20 ECAL detector configuration
  - Pion and Muon beams (for positive & negative magnet polarities)

MINERvA Test Beam Spectrometer



- A very low momentum, tertiary beamline has been built by MINERvA collaboration with support from the Fermilab Test Beam Facility (FTBF)
  - 0.4 – 1.5 GeV π, proton beam (from incoming 16 GeV π)
- The time-of-flight (TOF) scintillation counters measure the transit time of the particles
- Hits on PWC1 through PWC4 help reconstruct the trajectory of the charged particle through the beamline
- For full event reconstruction – beamline and MINERvA DAQ are merged

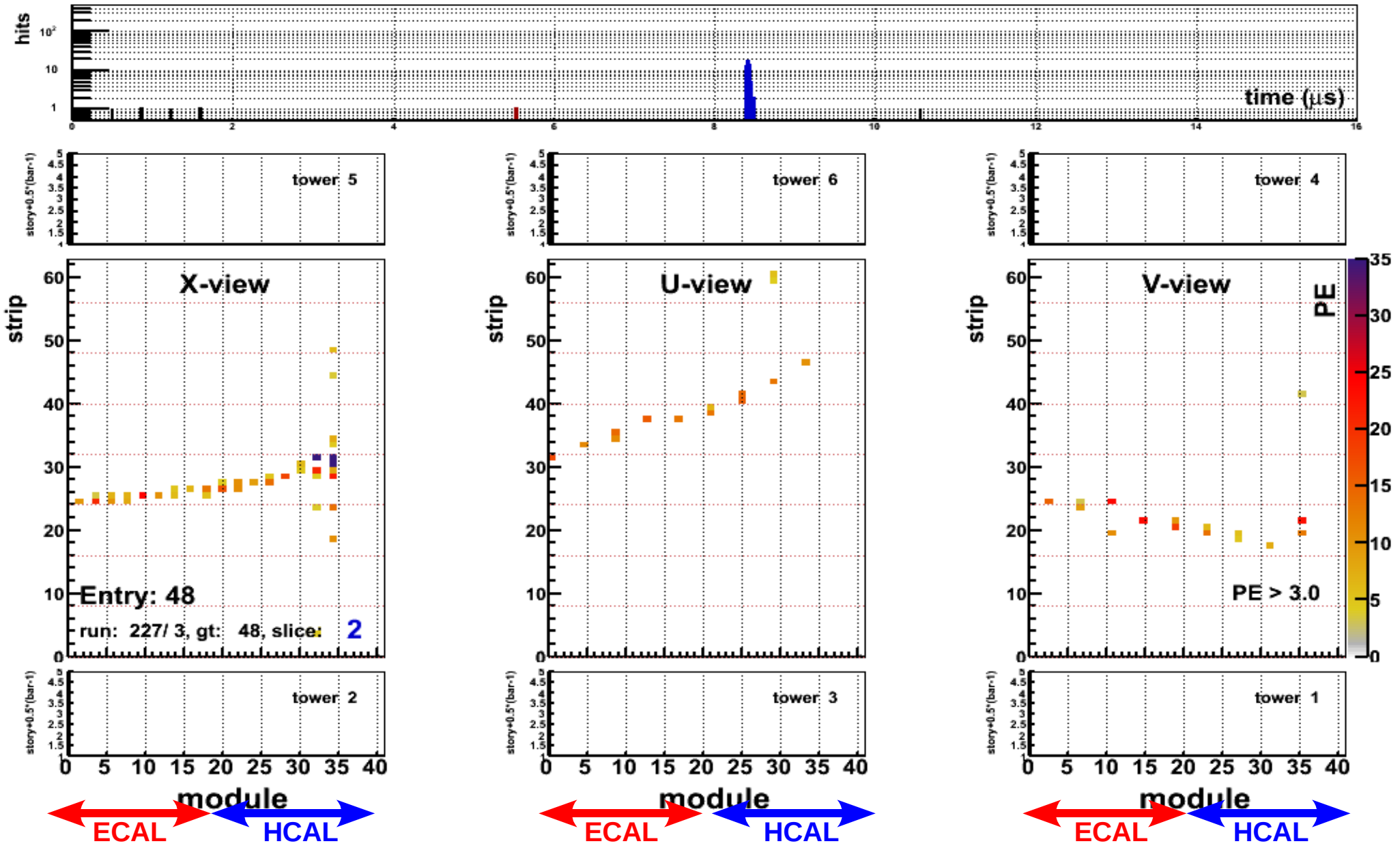
MINERvA Test Beam Detector (20 ECAL – 20 HCAL)



- 40 planes – 1.07m x 1.07m in size
- Reconfigurable – can “shuffle” the absorber & plane positions for different configurations
  - ECAL: Pb-Scintillator, HCAL: Steel-Scintillator
- Planes oriented at +60° & -60° w.r.t each other (XUXV) to match MINERvA configuration

Event Display from a TB run

- Event display is from a **20ECAL-20HCAL** detector run
- 1.35 GeV pion candidate interacting in the HCAL



Data sets recorded during June-July Physics run

- **20ECAL-20HCAL detector :**
  - Negative Pion run :
    - No. of triggers recorded – 77203
  - Positive Pion run :
    - No. of triggers recorded – 73685
  - Beam Muon run :
    - No. of triggers recorded – 16167
- **20TRK-20ECAL detector :**
  - Positive Pion run :
    - No. of triggers recorded – 98119
  - Negative Pion run :
    - No. of triggers recorded – 13105
  - Beam Muon run :
    - No. of triggers recorded – 17537
- **Reconstruction Efficiency (preliminary) :**
  - % of good reconstructable triggers – ~ 10-12%

Preliminary TOF and Momentum distributions (June 7-27 runs)